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ABSTRACT

The correlation was examined between the Officer Selection Battery (OSB) and the five areas of evaluation comprising the Army Reserve Officers Training Corps (ROTC) Basic Camp Student Evaluation Report: physical fitness, graded military skills, job performance, peer rating, and academic potential and grades. The moderating effect of the educational level of the ROTC recruit on OSB scores was also investigated. The sample consisted of 3,668 ROTC candidates who were given the OSB during basic camp in 1983 and who had scores on the ROTC Basic Camp Student Evaluation Report. The correlation between OSB and the Cooperative School and College Ability Tests was .79, supporting the OSB's validity as a measure of scholastic aptitude. However, the correlations between the OSB and the other four areas comprising the ROTC Basic Camp Student Evaluation Report ranged from .07 to .25. The correlation between the OSB and the Student Potential Index (SPI), a composite score based upon separate weightings of the five individual areas on the Student Evaluation Report, was directly related to the weighting OSB assumed in the computation of SPI. It was recommended that increasing the weight given the academic component of the Student Potential Index be considered. (Author/GDC)

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Technical Report 676

Correlation Between the Officer Selection Battery and the ROTC Basic Camp Student Evaluation Report

Clessen J. Martin and Lawrence M. Hanser

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The report examines the correlation between the Officer Selection Battery (OSB) and the five individual areas of evaluation comprising the ROTC Basic Camp Student Evaluation Report. Also examined is the extent to which performance on the OSB is moderated by the educational level of the ROTC recruit. The sample consisted of 3,668 ROTC candidates who were tested on the OSB during ROTC Basic Camp in 1983 and who had scores on the ROTC Basic Camp Student Evaluation Report. The correlation between OSB and the Cooperative School and College Ability Tests (SCAT) was .79 and provides (continued)

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evidence for the validity for the OSB as a measure of scholastic aptitude. However, the correlations between the OSB and the other four areas comprising the ROTC Basic Camp Student Evaluation Report ranged from .07 to .25. The correlation between the OSB and the Student Potential Index (SPI), a composite score based upon separate weightings of the five individual areas on the Student Evaluation Report, is directly related to the weighting OSB assumes in the computation of SPI. It is recommended that consideration be given to increasing the weight given the academic component of the Student Potential Index.

Technical Report 676

Correlation Between the Officer Selection Battery and the ROTC Basic Camp Student Evaluation Report

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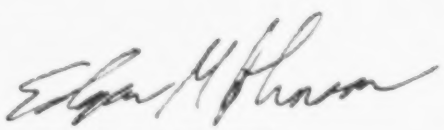
FOREWORD

The Army Research Institute and the American Institutes for Research have developed the Officer Selection Battery (OSB) for use in selecting young men and women for Advanced Army ROTC and for Army Officer Candidate School. The test was developed in response to the Army's determination to select officer candidates on dimensions considered to be important for successful officer job performance.

The present Technical Report is provided in response to a request from the Deputy Chief of Staff for ROTC to determine the correlations between the OSB and the five individual areas of evaluation comprising the ROTC Basic Camp Student Evaluation Report. Based upon the results of this research, it is recommended that consideration be given to increasing the weight given the OSB component in the Student Potential Index.



EDGAR M. JOHNSON
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CORRELATION BETWEEN THE OFFICER SELECTION BATTERY AND
THE ROTC BASIC CAMP STUDENT EVALUATION REPORT

EXECUTIVE SUMMARY

Requirement:

To determine (1) the correlation between the Officer Selection Battery (OSB) and the five individual areas of evaluation comprising the ROTC Basic Camp Student Evaluation Report and (2) the extent to which performance on the OSB is moderated by the educational level of the ROTC recruit.

Procedure:

Data from 3,668 ROTC candidates who were tested on the OSB during ROTC Basic Camp in 1983 and for whom scores were available on the ROTC Basic Camp Student Evaluation Report were analyzed. Correlations were computed between the OSB and the five individual areas comprising the ROTC Basic Camp Student Evaluation Report in addition to the educational level of the ROTC candidates.

Findings:

The correlation between the OSB and the academic measure (SCAT) on the Student Evaluation Report was .79. However, for the remaining four measures on the Student Evaluation Report, the correlations ranged from .07 to .25.

Utilization of Findings:

The Student Potential Index (SPI), which is a composite score based upon separate weightings of the five individual areas on the Student Evaluation Report, presently assigns a 10% weighting factor to the academic measure. Because of the importance of academic ability in successful completion of the ROTC program, consideration should be given to increasing the weight given the OSB component of the Student Potential Index.

CORRELATION BETWEEN THE OFFICER SELECTION BATTERY AND
THE ROTC BASIC CAMP STUDENT EVALUATION REPORT

CONTENTS

	Page
INTRODUCTION	1
METHOD	1
RESULTS AND DISCUSSION	2
CONCLUSIONS AND RECOMMENDATIONS	4
REFERENCE	5
APPENDIX A. Principal Components Factor Analysis of the Student Evaluation Report	6
B. Distribution of OSB Scores Across Four OSB Categories, Six Racial Groups, and Sex	7

LIST OF TABLES

Table 1.	Correlation of the five evaluation areas and the weights for computing the Student Potential Index	1
2.	Intercorrelation matrix among the five areas on the ROTC Basic Camp Student Evaluation Report, SPI, OSB, and EDUC	3
3.	Four different weighting schemes of the five evaluation areas on the Student Evaluation Report	4

CORRELATION BETWEEN THE OFFICER SELECTION BATTERY AND THE ROTC BASIC CAMP STUDENT EVALUATION REPORT

INTRODUCTION

The purpose of this research is to examine the correlation between the Officer Selection Battery (OSB) and the five individual areas of evaluation comprising the ROTC Basic Camp Student Evaluation Report, and to assess the extent to which performance on the OSB is moderated by the educational level of the ROTC recruit. The Officer Selection Battery (OSB) is a recently developed paper-and-pencil test (Fischl, Edwards, Claudy, and Rumsey, 1986) for selecting men and women for Advanced Army ROTC and for Army Officer Candidate School. Content specification for the test items in the OSB involved identification of the dimensions considered to be important for successful officer job performance. Correspondingly, the ROTC Basic Camp Student Evaluation System is designed to assess the student's military knowledge, skills, and officer potential within an operational officer training environment.

METHOD

The sample consisted of 3,668 ROTC candidates who were tested on the OSB during ROTC Basic Camp in 1983 and for whom scores on the ROTC Basic Camp Student Evaluation Report were available. The Student Evaluation Report provides a summary in Army Standard Score units of five individual areas of evaluation in addition to a sixth measure, the Student Potential Index (SPI), which is a composite score based upon separate weightings of the five individual areas. Table 1 presents the five areas of evaluation and the weighting of each area for the Student Potential Index.

Table 1

Correlation of the Five Evaluation Areas and the Weights for Computing the Student Potential Index

Evaluation Area	Weighting
1. Physical Fitness Test (PFT)	20%
2. Graded Military Skills Test (GMST)	30%
3. Job Performance Rating (JPR)	20%
4. Peer Rating (PR, Total)	10%
a. Future Manager/Supervisor/Commander	(5%)
b. Student Team Member	(5%)
5. Academic (ACAD, average of a and b below)	20%
a. Student Grade Point Average	(10%)
b. Scholastic Potential (SCAT, CEB)	(10%)
6. Student Potential Index (SPI, Total of Weighted Army Standard Scores for Areas 1-5)	

The Physical Fitness Test (PFT) comprises the following events: run, dodge, jump; pushups; bent leg situps; inverted crawl; a two-mile run and an 80-meter shuttle run for men and a one-mile run for women. The Graded Military Skills Test (GMST) is designed to measure the student's ability to apply military skills in the following areas: individual and team tactics, first aid, communication, basic rifle marksmanship, and land navigation. The Job Performance Rating (JPR) is completed by the platoon advisor on each student and is designed to provide an assessment of the student's ability to handle people and situations and to assist the student in developing potential for becoming an Army officer. For the Peer Rating (PR) measure, each student is rated by all other students as future managers/supervisors/commanders and in regard to their contributions as team members in accomplishing mission objectives. The Academic (ACAD) measure comprises the student's grade point average ($ACAD_a$) and scholastic potential ($ACAD_b$) as measured by either the Cooperative School and College Ability Tests (SCAT) or the Cadet Evaluation Battery (CEB). Finally, a composite score, the Student Potential Index (SPI), is based upon a total of the five weighted Army Standard Scores as shown in Table 1.

A variable (EDUC) related to education level was constructed by assigning 1 to high school level recruits; 2 to college freshmen; 3 to college sophomores; and 4 to college juniors, seniors, and graduate students; all other variables used in the analyses were expressed in Army Standard Scores. In addition, to the standard SPI (SPI-S), three other SPI indices were computed and analyzed separately. Because the OSB was designed to replace the SCAT or CEB, a second Student Potential Index (SPI-2) was computed in which OSB replaced SCAT or CEB (5b in Table 1). A third Student Potential Index (SPI-3) was computed in which the weighting for GMST (Area 2 in Table 1) was weighted 20% and OSB was increased to 20%. Finally, a fourth Student Potential Index (SPI-4) was computed in which evaluation areas 1, 2, and 3 in Table 1 were each assigned 15% and OSB was increased to 35%. These weights were chosen in order to increase the weighting of OSB in relation to the Graded Military Skills Tests in the computation of the Student Potential Index.

RESULTS AND DISCUSSION

Table 2 presents the intercorrelation matrix among the six measures on the ROTC Basic Camp Student Evaluation Report in addition to the Officer Selection Battery (OSB) and Education Level (EDUC). Because the Student Potential Index (SPI) comprises five separate evaluation areas, the rather large correlations between each of the five separate areas and SPI were expected. Of major interest in Table 2 is the correlation between OSB and the separate measures on the Student Evaluation Report. The correlation of .79 between the OSB and the $ACAD_b$ (SCAT) provides evidence for the validity of OSB as a measure of scholastic aptitude. Since the OSB was designed to replace $ACAD_b$ in the Cadet Evaluation Battery and has been shown to have correlations ranging from .78-.85 with the SAT (Fischl, Edwards, Claudy, and Rumsey, 1986), the rather substantial correlation with the academic measure was expected.

Table 2

Intercorrelation Matrix Among the Five Areas on the ROTC Basic Camp Student Evaluation Report, SPI, OSB, and EDUC

	PFT	GMST	JPR	PR_a	PR_b	$ACAD_a$ (GPA)	$ACAD_b$ (SCAT)	SPI	OSB	EDUC
PFT	1.00									
GMST	.44	1.00								
JPR	.42	.39	1.00							
PR_a	.45	.42	.67	1.00						
PR_b	.44	.42	.61	.88	1.00					
$ACAD_a$ (GPA)	.09	.10	.08	.07	.11	1.00				
$ACAD_b$ (SCAT)	.13	.30	.19	.18	.21	.30	1.00			
SPI	.73	.80	.74	.70	.69	.29	.44	1.00		
OSB	.07	.25	.13	.14	.17	.30	.79	.34	1.00	
EDUC	.03	.00	.05	.06	.09	.00	.00	.03	.08	1.00

The education level (EDUC) variable has no significant relationship with any variable in Table 2. Although the rank ordering of the education variable is arbitrary and perhaps somewhat gross, the differences in the means on the OSB for the four groups were in the expected direction. The mean raw scores on the OSB for high school seniors (N=444); freshmen (N=412); sophomores (N=2,159), juniors, seniors, and graduate students (N=651) were: 71.99, 74.26, 74.92, and 76.07, respectively. On average, more academically experienced students scored higher on OSB.

In order to determine whether level of Education had a moderating effect on OSB scores in the prediction of the Student Potential Index (SPI), a general linear model analysis was used in which OSB, Education level, and the interaction of OSB by Education level were entered as the predictor set. The resulting R^2 was .12 with OSB as the major contributing variable (F = 485.23; df = 1/3,658; $p<.0001$). The overall interaction effect of OSB X Education level was not significant. However, separate analyses of each Education level X OSB revealed a significant effect (F = 7.15; df = 1/3,658; $p<.008$) for the OSB and the Education level 1/non-Education level 1 categorical variable. In a second general linear model analysis in which the interaction effects of OSB and the Education level categorical variables were omitted from the predictor set, there was only a .002 decrease in R^2. Thus, the relationship between OSB and SPI is moderated only very slightly by Education level.

Obviously, the correlation between OSB and SPI is directly related to the weighting OSB assumes in the computation of SPI. When the weightings of PFT, GMST, and JPR are reduced as in SPI-4, there is an increase in the correlation between OSB and SPI (r=.61). The basis for the alternate weighting schemes was a factor analysis of the evaluation areas comprising the SPI. Results of the factor analyses are presented in Appendix A. Briefly, the results from the

principal components factor analysis yielded two major factors. Factor 1 accounted for 46% of the variance and Factor 2 17% of the variance. Inspection of Appendix A reveals the PFT, GMST, JPR, PR_a and PR_b all loading on the same factor. These results provided the impetus for the alternate weighting schemes proposed in Table 3.

Table 3

Four Different Weighting Schemes of the Five Evaluation Areas on the Student Evaluation Report

Evaluation Area	Weighting Factors			
	SPI-S	SPI-2	SPI-3	SPI-4
1. PFT	.20	.20	.20	.15
2. GMST	.30	.30	.20	.15
3. JPR	.20	.20	.20	.15
4. PR				
a. Future Manager	.05	.05	.05	.05
b. Student Team Leader	.05	.05	.05	.05
5. ACAD				
a. GPA	.10	.10	.10	.10
b. SCAT	.10			
c. OSB		.10	.20	.35
6. SPI r OSB		.34	.43	.61

Finally, the relationship between four OSB categories and the frequency with which Race and Sex categories scored in these categories was determined. The four OSB categories were based upon Army Standard Scores on the OSB and were: Cat 1 = 97 or greater; CAT 2 = 94-96; CAT 3 = 92-93; CAT 4 = 91 and below. These results are presented in Appendix B. Since there are different conversion tables for high school seniors (EDUC 1), this group was omitted in the analyses presented in Appendix B.

CONCLUSIONS AND RECOMMENDATIONS

The Officer Selection Battery provides a satisfactory measure of academic ability. With the exception of the academic ($ACAD_b$) measure in the present SPI, there is relatively little relationship between performance on the OSB and the remaining measures comprising the Student Potential Index. Based upon the results of this investigation, the following recommendations appear to be warranted:

1. The OSB is a satisfactory measure of academic ability and may replace other academic measures in the Student Potential Index.
2. Because of the importance of academic ability in successful completion of the ROTC program, consideration should be given to increasing the weight given the OSB component of the Student Potential Index.

REFERENCE

Fischl, M.A., Edwards, D.S., Claudy, J.G., and Rumsey, M.G. Validation of Officer Selection Battery Forms 3 and 4. ARI Technical Report 603, March 1986.

APPENDIX A

PRINCIPAL COMPONENTS FACTOR ANALYSIS OF THE STUDENT EVALUATION REPORT

Evaluation Area	Factor Loadings	
	Factor 1	Factor 2
PFT	.66	-.08
GMST	.66	.13
JPR	.79	-.16
PR_a	.88	-.22
PR_b	.87	-.17
$ACAD_a$ (GPA)	.21	.77
$ACAD_b$ (SCAT)	.38	.71

APPENDIX B

DISTRIBUTION OF OSB SCORES ACROSS FOUR OSB CATEGORIES, SIX RACIAL GROUPS, AND SEX

OSB Category	Army Standard Score
OSBCAT 1	97 or greater
OSBCAT 2	94 - 96
OSBCAT 3	92 - 93
OSBCAT 4	91 or below

OSBCAT	FREQ	CUMULATIVE PERCENT
White - Females		
1	322	67
2	38	75
3	19	79
4	99	100
Asian - Females		
1	1	14
2	1	29
3	3	71
4	2	100
Black - Females		
1	27	14
2	20	19
3	9	24
4	145	100
American Indian - Females		
1	0	0
2	1	33
3	1	67
4	1	100
Other - Females		
1	1	13
2	3	50
3	2	75
4	2	100
Unknown - Females		
1	1	33
2	0	33
3	0	33
4	2	100

OSBCAT	FREQ	CUMULATIVE PERCENT
White - Males		
1	1358	71
2	151	79
3	65	83
4	330	100
Asian - Males		
1	17	40
2	3	47
3	3	53
4	20	100
Black - Males		
1	110	21
2	43	29
3	23	34
4	344	100
American Indian - Males		
1	3	50
2	0	50
3	1	67
4	2	100
Other - Males		
1	24	49
2	2	53
3	3	59
4	20	100
Unknown - Males		
1	7	58
2	0	58
3	0	58
4	5	100